

AMENDMENTS TO THE CLAIMS:

Claim 1. (Original) A light emitting diode driving circuit comprising:

a control pulse signal generator for generating a control pulse signal having a variable duty factor;

a smoothing circuit for smoothing said control pulse signal to generate a control voltage;

a driving circuit for generating a driving voltage according to said control voltage and supplying a forward current to said light emitting diode; and

a switching circuit for interrupting the forward current of said light emitting diode in response to said control pulse signal.

Claim 2. (Original) A circuit according to claim 1, wherein said control pulse signal generator comprises:

a light adjustment pulse signal generating circuit for generating a light adjustment pulse signal of a duty factor according to a light adjustment amount; and

a control pulse signal generating circuit for setting a pulse signal obtained by adjusting the duty factor of said light adjustment pulse signal to said control pulse signal.

Claim 3. (Original) A circuit according to claim 2, wherein said switching circuit interrupts the forward current of said light emitting diode in response to said light adjustment pulse signal in place of said control pulse signal.

Claim 4. (Original) A circuit according to claim 1, further comprising:

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a minimum control voltage generating circuit for generating a predetermined minimum control voltage; and

a control voltage switching circuit for setting said minimum control voltage to the control voltage of said driving circuit in place of said control voltage when said control voltage drops to a predetermined value or lower.

Claim 5. (Original) A light emitting diode driving circuit comprising:

a control pulse signal generator for generating a control pulse signal having a variable duty factor;

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cont a smoothing circuit for smoothing said control pulse signal to generate a control voltage;

a driving circuit for generating a driving voltage according to said control voltage and supplying a forward current to said light emitting diode;

a minimum control voltage generating circuit for generating a predetermined minimum control voltage; and

a control voltage switching circuit for setting said minimum control voltage to the control voltage of said driving circuit in place of said control voltage when said control voltage drops to a predetermined value or lower,

wherein said control pulse signal generator includes

a light adjustment pulse signal generating circuit for generating a light adjustment pulse signal of a duty factor according to a light adjustment amount, and

a control pulse adjusting circuit for adjusting change characteristics of the duty factor of said light adjustment pulse signal and generating said control pulse signal.

Claim 6. (New) A light emitting diode driving circuit comprising:

a luminance controller that approximates the luminance change characteristics of a light emitting diode with the luminance change characteristics of a lamp.

Claim 7. (New) The circuit of claim 6, wherein said luminance controller matches the rate of change of luminance of the light emitting diode to approximate the rate of change of luminance of a lamp.

Claim 8. (New) The circuit of claim 6, wherein said luminance controller comprises a pulse width adjuster that adjusts a pulse time width of a pulse signal from an illuminance controller to generate an adjusted pulse signal.

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Claim 9. (New) The circuit of claim 8, wherein said luminance controller further comprises:

a pulse amplitude stabilizer that stabilizes the amplitude of a pulse signal from the illuminance controller to provide a stabilized pulse control signal to said pulse width adjuster;

a smoothing circuit that smooths the adjusted pulse signal to generate a smoothed pulse signal;

a current interrupter that interrupts a supply of current to the light emitting diode in response to the adjusted pulse signal;

a control voltage switch that selects one of the smoothed pulse signal from the smoothing circuit and a minimum voltage from a minimum voltage generator; and

a constant voltage driver that provides the supply of current to the light emitting diode

in proportion to the selected signal from the control voltage switch.

Claim 10. (New) The circuit of claim 8, wherein said luminance controller further comprises:

a pulse amplitude stabilizer that stabilizes the amplitude of a pulse signal from the illuminance controller to provide a stabilized pulse control signal to said pulse width adjuster;

a current interrupter that interrupts a supply of current to the light emitting diode in response to the adjusted pulse signal;

a control voltage switch that selects one of the adjusted pulse signal and a minimum voltage from a minimum voltage generator;

a smoothing circuit that smooths the selected signal to generate a smoothed signal;
and

a constant voltage driver that provides the supply of current to the light emitting diode in proportion to the smoothed signal.

Claim 11. (New) The circuit of claim 8, wherein said luminance controller comprises a pulse amplitude stabilizer that stabilizes the amplitude of the pulse signal from the illuminance controller and wherein said pulse width adjuster adjusts the amplitude stabilized pulse signal from the pulse amplitude stabilizer.

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Claim 12. (New) The circuit of claim 6, wherein said luminance controller comprises a maximum voltage generator that generates a maximum voltage that corresponds to a current supply which provides a maximum luminance from the light emitting diode.

Claim 13. (New) The circuit of claim 6, wherein said luminance controller comprises a minimum voltage generator that prevents a sudden luminance decrease by said light emitting diode.

Claim 14. (New) The circuit of claim 6, wherein said luminance controller comprises a smoothing circuit.

Claim 15. (New) The circuit of claim 6, wherein said luminance controller comprises a control voltage switch.

Claim 16. (New) The circuit of claim 6, wherein said luminance controller comprises a current interrupter that interrupts the supply of current to the light emitting diode in response to a pulse signal.

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Claim 17. (New) The circuit of claim 6, wherein said luminance controller comprises a control voltage generator that adjusts a current supply to the light emitting diode based upon the luminance change characteristics of a light emitting diode.

Claim 18. (New) The circuit of claim 6, wherein said luminance controller adjusts a time width of a pulse control signal based upon the luminance characteristics of the light emitting diode.

Claim 19. (New) The circuit of claim 18, wherein said luminance controller increases the

pulse width of said pulse control signal.

Claim 20. (New) The circuit of claim 6, wherein said luminance controller comprises at least two of:

a pulse width adjuster that adjusts a time width of a pulse signal based upon the luminance characteristics of the light emitting diode;

a minimum voltage generator that prevents a sudden luminance decrease by said light emitting diode; and

a current interrupter that interrupts the supply of current to the light emitting diode in response to a pulse signal.

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